Zeeland Non-motorized System Plan

• Existing Pedestrian Facilities and Analysis of Prospective Development

• Existing Bicycle Facilities and Methodology for Planning of Future Development

1. On-street and off-street (trails) pathways
2. Crossing of I-196 Business route
Existing Pedestrian Facilities

**EXISTING PEDESTRIAN FACILITIES WITHIN STREET NETWORK**

- **No Pedestrian Facilities**: 7.2 miles (21%)
- **Sidewalks / Side Paths on one side**: 9.9 miles (30%)
- **Sidewalks / Side Paths on both sides**: 16.5 miles (49%)

**Total linear length**: 46.5 miles

**Benchmark – Ideal state: ADA compliant sidewalks on both sides on the street**

**Deficiency**
- 7.2 miles (No pedestrian facilities)
- 9.9 miles (Sidewalks/Side Paths on one side)
- 17.1 miles Total

**EXISTING PEDESTRIAN FACILITIES OUTSIDE OF STREET NETWORK – SHARED USE PATHS: 3.6 MILES**
Zeeland Non-motorized System Masterplan

Ranking deficiencies for future development

Priority criteria

• No sidewalk within 1/2 mile of school
• No sidewalk within ½ mile to mass transit
• No sidewalk in residential zones: R3, R2, R1
• No sidewalk on streets with speed limit > 25MPH
• Major destination adjacent to segment
• Link is only gap in adjacent system
Zeeland Non-motorized System Plan

Ranking deficiencies for future development

<table>
<thead>
<tr>
<th>Unique ID</th>
<th>Full Street Name</th>
<th>Speed Limit</th>
<th>Sidewalk Present on Side of Street</th>
<th>Truck Route</th>
<th>Number of Lanes</th>
<th>Width</th>
<th>ROW W/ Width On Street Parking</th>
<th>Side of Street (OSP)</th>
<th>Bike Level of Stress</th>
<th>Street Length</th>
<th>Within 1/2 mile to School</th>
<th>Within 1/2 mile to Mass Transit</th>
<th>Residential Zoning</th>
<th>Major Destination</th>
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Priority criteria:

- No sidewalk within 1/2 mile of school
- No sidewalk within 1/2 mile to mass transit
- No sidewalk in residential zones: R3, R2, R1
- No sidewalk on streets with speed limit > 25MPH
- Major destination adjacent to segment
- Link is only gap in adjacent system
Zeeland Non-motorized System Plan

Sidewalk Priorities
Existing Bike Facilities Definitions

- **Shared Lanes – On-road bikeways on roadways where bicycles may be operated unless prohibited by statue or regulation. Usually bicycles and motor vehicles share the same travel lane.**

- **Marked Shared Lane – A shared lane marked with Shared Lane Markings or “Sharrows.” The marking is intended to assist bicyclists with lateral positioning in a shared travel lane.**

- **Paved Shoulders – A shoulder is the portion of the roadway contiguous with the travelled way that accommodates stopped vehicles, emergency use and support of the roadway pavement.**

- **Bike Lanes – A portion of the roadway designated for preferential or exclusive use by bicyclists by pavement markings and signs. Bike lanes are typically located on the right side of the roadway but can be located along the left side of one-way streets.**
Zeeland Non-motorized System Plan

Existing Bike Facilities Definitions

• Bicycle Boulevards – A local street or series of contiguous street segments that have been modified to function as a through way for cyclists, while discouraging through motor vehicle traffic.

• Shared Use Paths – an off-road facility physically separated from motorized traffic by an open space or barrier. Shared-use paths can be used by pedestrians (including skaters, wheelchairs and joggers). A Share Use Path parallel to the road and within the road ROW is referred to as Side Path.

• Bicycle Routes

• Cycle Tracks (separated bike lanes) – A cycle track is physically separated from motor vehicle traffic travel lanes and parking lanes, and distinct from sidewalks. Unlike a shared-use path, cycle tracks are intended for exclusive use of bicyclists. Cycle tracks can be one-way or two-way and can be at street level, sidewalk level or at an intermediate level between the street and sidewalk.
Zeeland Non-motorized System Masterplan
Zeeland Non-motorized System Plan

Existing Bike Facilities

**EXISTING BIKE FACILITIES WITHIN STREET NETWORK**

- **Side Paths**: 10.1 miles (30%)
- **On-street Bike Lanes**: 1.0 miles (3%)
- **Shared Use Paths**: 3.6 miles
- **Total**: 14.7 miles

**EXISTING BIKE FACILITIES OUTSIDE OF STREET NETWORK – SHARED USE PATHS: 3.6 MILES**

**Benchmark – Level of Traffic Stress for different user groups LTS 1, LTS2, LTS3, LTS 4**
“Low Stress Bicycling and Network Connectivity” Mineta Transportation Institute, Report 11-19, May 2012

- Classifies road segments based on perceived safety issues with close proximity to traffic
- Allows for quick assessment of system connectivity without burden of more intensive methods.
- Ability to prioritize improvements, to maximize connectivity for different user groups
- Most data should be part of TSP (Transportation System Plan) inventories or easily obtainable.
- Visual-based results for easy communication between staff, stakeholders, and the public.
Bicyclists see different “networks” based on perceived “level of traffic stress (LTS)”

• Strong And Fearless (<1%) LTS 4
• Enthused and Confident (7%) LTS 3
• Interested but Concerned (60%) LTS 1, LTS2 suitable for all cyclists, including 5th grade children
• No Way No How (33%)
Zeeland Non-motorized System Plan

Bicycle Level of Traffic Stress LTS 1

- Low speeds
- No more than one lane per direction
- Intersections easy to cross by all
- Suitable for all cyclists, including 5th grade children and supervising riding parents
- Residential local streets, separated paths, or cycle tracks
• Slightly higher speeds low traffic volumes
• Up to 3 lanes wide in total
• Intersections not difficult to cross
• Suitable for teen and adult cyclists
• Collector-level streets with bike lanes and central business districts
• Moderate speeds and higher traffic volumes
• Up to 5 lanes wide in total
• Intersections crossings still perceived safe
• Moderate stress – tolerable for many cyclists
• Low speed arterials with bike lanes or moderate speed two/three-lane roadways
• Moderate to high speeds, high traffic volumes

• From 2 to greater than 5 lanes

• Intersections may be judged unsafe or difficult to cross

• High – speed /multilane roadways with narrow or no bike lanes

• High stress – suitable for experienced or skilled cyclists
Bicycle Level of Traffic Stress

City of Zeeland Streets LTS

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<th>LTS</th>
<th>Miles</th>
<th>Percentage</th>
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<td>21.4 miles</td>
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<tr>
<td>2</td>
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MDOT I-196 Business Route

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<tr>
<th>LTS</th>
<th>Miles</th>
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<tr>
<td>4</td>
<td>4.1 miles</td>
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</table>
Zeeland Non-motorized System Plan

Bicycle Level of Traffic Stress and Bicycle Crashes

Bicycle Crashes 2008-2017

- 2008: 3
- 2009: 1
- 2010: 0
- 2011: 2
- 2012: 1
- 2013: 5
- 2014: 3
- 2015: 0
- 2016: 1
- 2017: 0
- TOTAL: 15

One fatality in 2011 at State St. and I-196 Bus

Majority of crashes on busiest streets and highest LTS:
- State St - 9
- Main Ave - 4
Zeeland Non-motorized System Plan

I-196 Business Route Crossing Alternatives

Alternative 1
Non-Motorized Bridge at S Maple Street

Alternative 2
Non-Motorized Bridge at Peck Street
Zeeland Non-motorized System Plan

I-196 Business Route Crossing Alternatives Additional Bikeway Improvements
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I-196 Business Route Crossing Alternatives

Alternative 3
Non-Motorized Tunnel at S State Street
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I-196 Business Route Crossing Alternatives

Alternative 3
Non-Motorized Tunnel at S State Street
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I-196 Business Route Crossing Alternatives

Alternative 4
Non-Motorized Bridge at 101st Street
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I-196 Business Route Crossing Alternatives Additional Bikeway Improvements
## Zeeland Non-motorized System Plan

### I-196 Business Route Crossing Alternatives

<table>
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<tr>
<th>ALTERNATIVE</th>
<th>Connectivity to Street Network</th>
<th>Connectivity to Regional System</th>
<th>Impact on vehicular traffic on street network</th>
<th>Impact of construction on I-196 Business Route</th>
<th>Drainage</th>
<th>Utility Conflicts</th>
<th>Cost</th>
<th>TOTAL SCORE</th>
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The Galveston Bridge in Chandler, Arizona is a vital link to the re-establishment of Chandler’s Bike System.
Thank you

Alan Pennington, PE
apennington@mbce.com

Piotr (Peter) Lewak
plewak@mbce.com